

Appl. No. 10/620,636
Amdt Dated May. 25, 2005
Reply to Office Action February 25, 2005

Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

Claim 1 (currently amended): A cooling device utilizing liquid coolant, comprising:

a tank comprising a plurality of parallel inner walls therein thereby defining a through channel for passage of the liquid coolant, a plurality of pins being disposed in the channel merely around a center portion of the tank;

an inlet and an outlet formed at the tank and disposed at opposite ends of the channel for entry and exiting of the liquid coolant into and from the tank; and

a cover hermetically sealing the tank.

Claim 2 (original): The cooling device of claim 1, wherein the tank comprises a base, and two pairs of sidewalls perpendicularly extending from the base and surrounding the inner walls.

Claim 3 (currently amended): The cooling device of claim 2, wherein the inlet and the outlet are perpendicularly disposed at opposite at least one of the sidewalls of the tank.

Claim 4 (original): The cooling device of claim 2, wherein the inner walls perpendicularly extend from the base, and the inner walls and the sidewalls are substantially equal in height.

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Claim 5 (original): The cooling device of claim 2, wherein the inner walls extend alternately from one of the sidewalls and an opposite sidewall.

Claim 6 (original): The cooling device of claim 5, wherein the inner walls are substantially uniformly spaced apart.

Claim 7 (original): The cooling device of claim 6, wherein a distance between a free end of each of the inner walls and a corresponding opposite sidewall is substantially equal to a distance between any two adjacent inner walls.

Claim 8 (original): The cooling device of claim 2, wherein the pins extend perpendicularly upwardly from the base.

Claim 9 (original): The cooling device of claim 8, wherein a height of the pins is substantially equal to a height of the sidewalls.

Claim 10 (canceled)

Claim 11 (currently amended): A cooling device comprising:

a tank including a base which defines holes at periphery thereof for positioning of the tank adapted to be in contact with a heat source;
a cover sealing the tank opposite to said base;
a horizontal sinuous channel defined in the tank;
working liquid filled in the channel; and
a plurality of small protrusions disposed in and along at least a portion of

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the channel for not only increasing heat transfer area between the working liquid and the tank but also resulting in turbulence for enhancement of heat exchange between the working liquid and the tank.

Claim 12 (original): The cooling device of claim 11, wherein said tank includes opposite inlet and outlet respectively communicatively connected to two opposite ends of the channel.

Claim 13 (original): The cooling device of claim 12, wherein the outlet and the inlet are substantially located on a periphery of the tank while the small protrusions are located around a center portion of the tank.

Claim 14 (original): The cooling device of claim 11, wherein said cover is not integrally formed with the tank.

Claim 15 (original): The cooling device of claim 11, wherein said small protrusions extend from the base.

Claim 16 (original): The cooling device of claim 11, wherein said tank includes a plurality of inner walls forming said sinuous channel.

Claim 17 (original): The cooling device of claim 11, wherein said small protrusions are pins.

Claim 18 (new): The cooling device of claim 2, wherein the base defines holes therein around the sidewalls, for positioning the tank.

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Claim 19 (new): The cooling device of claim 12, wherein the inlet and the outlet extend outwardly from opposite extremities of the channel and along a direction parallel to the base.

Claim 20 (new): A cooling device comprising:

a tank including a planar base adapted to be in contact with a heat source;

a cover sealing the tank opposite to said base;

a horizontal sinuous channel defined in the tank;

working liquid filled in the channel; and

a plurality of small protrusions disposed in and along at least a portion of the channel for not only increasing heat transfer area between the working liquid and the tank but also resulting in turbulence for enhancement of heat exchange between the working liquid and the tank; wherein

said protrusions extends from one of said base and said cover toward the other, and the working liquid moves from a front end of said sinuous channel to a rear end of the sinuous channel.

Claim 21 (new) The cooling device as described in claim 20, wherein said protrusions contact and terminates at the other.